

REMARKS

The Official Action mailed July 27, 2005, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statement filed on January 20, 2004. Attached herewith is a *Request for Corrected PTO 1449 Form*. The Applicant respectfully requests that the Examiner provide an initialed copy of the corrected Form PTO-1449.

Apparently due to a printing or scanning error, marks appear on the copy of the Form PTO-892 attached to the Official Action and provided in the Image File Wrapper, and the marks have partially obscured the citation of the Bruel article. Specifically, although "Vol. 31" was originally printed, the marks on the copy of the Form PTO-892 make "Vol. 31" appear to be "Vol. 34" (reproduced below).

NON-PATENT DOCUMENTS		
Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)		
y, July 1995, Electronics Letters, Vol. 34, Issue 14, pages 1201-1202.		

For the record, the Applicant notes that this citation should refer to "Vol. 31." If appropriate, the Applicant requests that the Form PTO-892 be reprinted or corrected to clarify this matter.

Claims 1-16 are pending in the present application, of which claims 1 and 2 are independent. Claims 1 and 2 have been amended to better recite the features of the present invention, and dependent claims 10 and 15 have been amended to correct a minor matter of form. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 2 of the Official Action rejects claims 1-2 and 7-16 as obvious based on the combination of U.S. Patent No. 5,258,323 to Sarma et al. and M. Bruel, "Silicon on insulator material technology," July 6, 1995, Electronics Letters, Vol. 31, Issue 14, pages 1201-1202. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Independent claims 1 and 2 have been amended to recite "bonding the first single crystal silicon substrate to a second substrate through the silicon oxide film with a bonded interface therebetween, ... carrying out a second heat treatment to a single crystal silicon film which remains on the second substrate in the separating step so that the bonded interface becomes stable; ... thermally oxidizing the silicon island in order to eliminate trap levels and defects from

the silicon island” (see, e.g., page 8, line 15 through page 9, line 12 of the specification). Sarma and Bruel, either alone or in combination, do not teach or suggest the above-referenced features of the present invention. Specifically, Sarma and Bruel do not teach or suggest a second heat treatment so that a bonded interface becomes stable or thermally oxidizing a silicon island in order to eliminate trap levels and defects from the silicon island. Since Sarma and Bruel do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Furthermore, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Sarma and Bruel or to combine reference teachings to achieve the claimed invention. MPEP § 2142 states that the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. It is respectfully submitted that the Official Action has failed to carry this burden. While the Official Action relies on various teachings of the cited prior art to disclose aspects of the claimed invention and asserts that these aspects could be modified in the manner asserted in the Official Action, it is submitted that the Official Action does not adequately set forth why one of skill in the art would combine the references to achieve the features of the present invention.

The test for obviousness is not whether the references “could have been” combined or modified as asserted in the Official Action, but rather whether the references should have been. As noted in MPEP § 2143.01, “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (emphasis in original). Thus, it is respectfully submitted that the standard set forth in the Official Action is improper to support a finding of *prima facie* obviousness.

The Official Action asserts that Sarma discloses steps of forming a silicon island by patterning a single crystal silicon film and thermally oxidizing the silicon island (page 2, Paper No. 0705).

The Official Action concedes that Sarma does not disclose the following:

... a semiconductor device and a corresponding method of manufacturing a semiconductor device, comprising a smart-cut process for forming a silicon island (a smart-cut process comprising the steps of: forming a hydrogen added layer by adding hydrogen to a first single crystal silicon substrate from a major surface side thereof, said first single crystal substrate having a silicon oxide film on the major surface; bonding the first single crystal silicon substrate to a second substrate through the silicon oxide film, said second substrate being as a support; separating the first single crystal silicon substrate by a first heat treatment; carrying out a second heat treatment to a single crystal silicon film which remains on the second substrate in the separating step; flattening a major surface of the single crystal silicon film). [pages 2-3, Id.]

The Official Action relies on Bruel to allegedly teach the above-referenced features missing from Sarma and asserts that "it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the semiconductor device and the corresponding method of manufacturing a semiconductor device of Sarma et al. by using a principle of smart-cut process for forming a silicon island as taught by Bruel (IEEE 1995) for achieving thin uniform SOI layers or providing major specific advantages" (page 3, Id.). The Applicant respectfully disagrees and traverses the above assertions in the Official Action.

It is not clear why one would have been motivated to incorporate the smart-cut process of Bruel into the Sarma method. Specifically, it is not clear why one of ordinary skill in the art who was concerned with a device for "achieving thin uniform SOI layers or providing major specific advantages" would not have simply practiced Bruel alone. It appears that "major specific advantages" refers to thickness uniformity, crystalline quality and electrical properties discussed at page 1202 of Bruel. The alleged motivation for combining Sarma and Bruel can be achieved from the device of Bruel alone and thus there is no need to combine the device of Bruel with Sarma. Sarma fails

to recognize thin uniform SOI layers, thickness uniformity, crystalline quality or electrical properties as a problem. Therefore, one of skill in the art would merely be led to practice Bruel alone in view of the asserted motivation and would not have been led to modify Sarma absent at least some suggestion that thin uniform SOI layers, thickness uniformity, crystalline quality or electrical properties is a problem in Sarma. That is, it is unclear why one of ordinary skill in the art at the time of the present invention would have incorporated the complicated smart-cut process of Bruel into Sarma absent some disclosure or suggestion that the advantages achieved in Bruel are necessary or desirable in Sarma.

Further, it is not sufficient to merely point out the advantages of two references and assert that it would have been obvious to combine the two references so that you can have both advantages in one device. Rather, in order to form a *prima facie* case of obviousness, the Official Action must show that the references should have been combined.

Therefore, the Applicant respectfully submits that the Official Action has not provided a proper suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Sarma and Bruel or to combine reference teachings to achieve the claimed invention.

In the present application, it is respectfully submitted that the prior art of record, either alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraphs 4 and 5 of the Official Action reject dependent claims 3-6 as obvious based on the combination of Sarma, Bruel and U.S. Patent No. 5,387,555 to Linn et al. or U.S. Patent No. 6,455,401 to Zhang et al.


Please incorporate the arguments above with respect to the deficiencies in Sarma and Bruel. Linn or Zhang does not cure the deficiencies in Sarma and Bruel. The Official Action relies on Linn or Zhang to allegedly teach the features of the dependent claims. Specifically, the Official Action relies on Linn to teach a temperature range for thermal oxidation (page 6, Paper No. 0705) and on Zhang to teach an oxidizing atmosphere comprising a halogen element (pages 6-7, *Id.*). However, Sarma, Bruel and Linn or Zhang, either alone or in combination, do not teach or suggest a second heat treatment so that a bonded interface becomes stable or thermally oxidizing a silicon island in order to eliminate trap levels and defects from the silicon island. Since Sarma, Bruel and Linn or Zhang do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Also, Linn or Zhang does not cure the deficiencies in the alleged motivation to combine Sarma and Bruel. Specifically, Linn or Zhang do not teach or suggest why one would have been motivated to incorporate the smart-cut process of Bruel into the Sarma method.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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